SUMMARY

Background

Systemic hypertension (SH) is a global public health problem and a leading cause of death worldwide. It runs a rapid course in the Black. Its diagnosis is made using office blood pressure measurement which is defined as a persistent elevation of systolic blood pressure (SBP) of equal to or greater than 140mmHg and or diastolic blood pressure (DBP) of equal to or greater than 90mmHg or self-reported use of drug treatment for SH irrespective of measured blood pressure (BP). It has been documented that 24-hour ambulatory blood pressure measurement (ABPM) is a better predictor of subsequent complications than are office blood pressure measurement.

Optimal management of SH begins with appropriate diagnosis and proper classification of BP phenotypes. Interestingly, the European Society of Cardiology guidelines encourage the use of ABPM in all patients with newly-diagnosed SH because ABPM helps to properly classify patients in terms of risk; by identifying various BP phenotypes such as white coat hypertension, masked hypertension and dipping patterns. Additionally, echocardiographic evaluation of left ventricular geometry and function also helps in further risk stratification.

Objectives

This study determined the relationship between ambulatory blood pressure (ABP) and left ventricular remodeling in newly-diagnosed hypertensive patients at University of Ilorin Teaching Hospital (UITH); the pattern of ambulatory blood pressure indices; the prevalence of white coat
hypertension, the degree of nocturnal dip and the association between ABP parameters and left ventricular geometric patterns, diastolic and systolic function.

**Methods**

The research was a cross-sectional study and ethical clearance was obtained from UITH Ethical and Research Committee. A total of 240 participants consisting of 120 patients with newly-diagnosed SH and 120 control participants completed the study. The patients in this study were antihypertensive-naïve adults whose systolic blood pressure were equal to or greater than 140mmHg and or diastolic blood pressure (DBP) of equal to or greater than 90mmHg while the control participants were adults whose both systolic and diastolic blood pressure were less than 140mmHg and 90mmHg respectively. Individuals with other co-morbidities and pregnant females were excluded from both the patient and control groups. ABPM, electrocardiography, echocardiography were carried out on all the study participants. The patterns of ABP, the left ventricular geometry and indices of left ventricular systolic and diastolic function were determined.

**Results**

A total of 240 participants consisting of 120 patients with newly-diagnosed SH and 120 control participants completed the study. The mean ABP values in the patient group were significantly higher than the control group. The prevalence of white coat hypertension among patients with newly-diagnosed SH was 36.7% while the prevalence of masked hypertension among the control participants was 4.2%. Among patients with newly-diagnosed SH, there were more risers (25.8%) compared with the control group (14.2%), \( p = 0.024 \). Furthermore, there was a significant difference in the mean nocturnal decline or dip among hypertensive patients with various dipping patterns: dippers, non-dippers and risers \( (13.2 \pm 2.1, 4.8 \pm 4.5, -5.4 \pm 4.5\% ) \) respectively; overall
Meanwhile, an association exists between nocturnal dip and left ventricular hypertrophy; as the mean LVMI in the risers (156 ± 45g/m²) was significantly higher than the non-dippers (135 ± 32g/m²), p = 0.024. An association also exist between nocturnal dip and left ventricular diastolic function as the risers had the lowest mitral E/A compared with non-dippers and dippers ((1.05 ± 0.32, 1.10 ± 0.33 and 1.35 ± 0.48) respectively, overall p-value=0.003. Office BP and all the ABPM indices (mean 24-hour, day-time and night-time ABP) had a positive correlation with LVM and LVMI. Also, all the ABPM indices had a positive correlation with LV geometry but had a negative correlation with diastolic function. However, only the mean night-time SBP had a negative correlation with the fractional shortening (FS). Office DBP and mean night-time SBP were predictors of LVMI while mean night-time DBP, age and office SBP were predictors of diastolic function. However, body mass index (BMI) and office SBP were predictors of electrocardiographic-determined LVH.

**Conclusion**

ABPM allows the circadian pattern of BP to be monitored and the various blood pressure phenotypes to be properly classified. This study demonstrated that about a third of patients with newly-diagnosed SH had white coat hypertension and only 4.2% of the control participants had masked hypertension. It also revealed that there were more risers among the patient group than the control group. The risers had the highest LVMI and this put them at the greatest risk of cardiovascular event.

**Recommendations**

The use of ABPM should be part of the routine work-up for patients with newly-diagnosed SH. It is of paramount importance to carry out ABPM on patients with incidental finding of left
ventricular hypertrophy as they may have masked hypertension. The participants with masked hypertension and the non-dipping BP pattern (both risers and non-dippers) are at risk of cardiovascular event and it would be important to follow them up.